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State of Utah

DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF WATER QUALITY

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June 6, 1997

Keith Droste, Executive Director
Tintic Utah Metals LLC
P.O. Box 51
Eureka, Utah 84628

Dear Mr. Droste:

Subject: UIC Area Permit Application Completeness Review for Burgin Mine (UIC Permit No. UTU500003)

We have finished our completeness review for the Burgin Mine UIC Area Permit application (UIC Permit No. UTU500003). Some portions of the application were incomplete. Also, as noted in our meeting with you, we have some major unresolved concerns about this project. The incomplete portions of the application and other concerns noted below must be satisfactorily addressed before we can proceed with the permitting process. We therefore request that you provide the following additional information:

1. Please evaluate what effects the injectate, under maximum anticipated hydraulic head(s) at each proposed injection site, may have on regional aquifers (confined and unconfined), perched aquifers, springs, wells, and Utah Lake. Include an evaluation of resulting ground water flow directions, the potential for the creation of new springs due to increased hydraulic head at the injection mound(s), and their possible effect(s) on surface waters, aquifers, and wells. Include qualitative as well as quantitative considerations, especially total dissolved solids (TDS), in all evaluations. See Item 4 and the enclosure for other required analytes.

   Specifically include aquifers and wells in Goshen Valley, and geothermal springs around and in Utah Lake in your evaluation. You must not only consider any increase in contaminant load, but also the possibility of instantaneous pressure-induced increases in flow rates of existing upward leakances of geothermal waters via diffuse flow and flow along faults and fractures (i.e., geothermal springs, etc.). Possible widening of solution channels due to the increased injectate temperature must also be considered. If existing wells may be affected, especially any operated by the towns of Elberta and Goshen, please provide pertinent

identity/location information, etc. Also, please indicate if the East Tintic geothermal aquifer has ever been used as a source of drinking water.

2. The area of review used in your area permit application was incorrect in that the two-mile radius was measured from an injection well site instead of from the project perimeter. Please show the correct area of review (on a topographic map of the area) as the project area plus a circumscribing area two lateral miles in width measured from the perimeter of the project area.

   The only artificial penetrations (other than mine shafts) shown within your original area of review were water wells owned by the City of Eureka and a well just northwest of the Burgin No. 1 mineshaft. We feel that many more may exist, i.e., bore holes, other wells used by past mining operations, etc.

   Please review Item 1, Item 4 and Item 5 requirements of the Technical Report Outline and re-evaluate your submittal for completeness with respect to the proper area of review (i.e., well/borehole location and I.D., construction details, well use, water levels, any available analyses, etc.). Please provide us with any missing data. If any wells, boreholes, etc. penetrate the injection zone within the area of review, please provide a proposed corrective action plan for any which are not properly completed or plugged.

3. Please provide piezometric maps of perched and regional ground water within the area of review (see Item 2 above) utilizing well or borehole information, etc. You will need this information in order for hydraulically upgradient and downgradient ground water sampling locations to be determined relative to each proposed injection well site. While we are fairly certain that Goshen Valley is receiving recharge from the East Tintic area, we also need to know if Cedar Valley or Rush Valley to the north receive regional ground water from this area. Indicate on a topographic map the location of the regional aquifer ground water divide.

   Please also provide estimates of average linear velocities of ground water for all ground water systems present (other than along faults).

4. Incomplete source water (injectate) analyses were submitted, and no receiving ground water analyses were submitted. Please provide representative water quality analyses for the injectate and for background ground water from all aquifers (including perched) adjacent to and hydraulically upgradient and downgradient from each proposed injection site. If there is no (or inadequate) existing data, please submit a plan to this office as to how you propose to provide the requested data. Samples should be taken approximately 100 feet horizontally beyond any associated mine workings/facilities (surface and underground). See enclosure for required analytes. If new monitoring wells are utilized, prior approval of their locations

and planned construction details should be obtained from this office, to facilitate their future use as approved monitoring wells should a UIC permit be issued (see Item 5 below). Analyses from the Pesticide/ PCB's/ SOC's list need not be provided unless there is a reasonable chance that a particular analyte might be present. Metals and volatile organic compounds (VOC's) are specifically requested due to the past mining history of the area.

It is to your advantage to have at least a year's worth of periodic (monthly/quarterly ?) ground water analyses prior to issuance of a permit, since ground water protection levels are based on background ground water quality. Too few samples may not indicate natural variability, which might result in some subsequent high values being incorrectly attributed to injection activities.

5. It appears that the proposed observation wells noted in the permit application may not be appropriately located for determining upgradient and downgradient background ground water quality relative to any of the proposed injection well sites, nor would be suitable for permit compliance monitoring. This is due to the fact that receiving ground water flow directions in the injection well areas are only guessed at, and the four proposed observation wells as shown on the map (Plate 1) are too far from the injection well sites to be considered relevant. The permit application refers to five observation wells, but only four are shown on the map.

   Please submit a revised ground water monitoring plan (upgradient and downgradient), with proposed monitoring well construction and completion details, for each proposed injection well site. All aquifers beneath each site must be monitored. See Item 14 of the Technical Report Outline.

6. Please evaluate the potential effects of the approximately 600 foot deep ground water "depression" to be formed around the ore body with regard to Goshen Valley aquifers, confined and unconfined. Specifically address the possible reversal of hydraulic gradient with attendant lowering of water tables or potentiometric head. If existing wells may be affected, especially any operated by the towns of Elberta and Goshen, please provide pertinent identity/location information, etc.

7. Please specifically identify and provide available analyses from the public water supply well(s) that are nearest the proposed injection wells in a hydraulically down-gradient direction.

8. Please evaluate the potential for induced earthquakes due to injection (direct or indirect) into the fault zones in the area, for each of the proposed injection sites. Consider hydraulic head (static, dynamic, and pump [if any]), injection depth, flow rate, volume, injectate temperature, and any other appropriate parameters.

9. Inasmuch as you have applied for an area permit, please provide appropriate latitudes and longitudes within which the proposed permit area lies.

10. Please provide more detailed regional and local cross-sections. See items 6(b) and 6(c) of the Technical Report Outline. Some general columnar sections of cenozoic and paleozoic rocks in the East Tintic Mining District were provided, but were not correlated to the actual injection sites.

11. Please indicate the location(s) of the extraction well(s) on a topographic map of the area, and provide latitude(s)/longitude(s).

12. Please provide additional injection well construction plans. We will require long string casings to be cemented back to the surface. Injection and extraction well casing/tubing or annular spaces must be capable of being pressure-tested, as this will be required as proof of mechanical integrity prior to startup and annually thereafter. See Item 9 of the Technical Report Outline for other applicable guidelines.

13. Your well plugging plan was not clear as to where the grout will start in the volcanics. We will require a compatible cement and/or bentonite plug from the base of the volcanics to near surface, capped with cement.

14. Proof of financial ability to properly plug and abandon all injection wells will be required prior to permit issuance.

15. Please check the submitted latitude/longitude of the Tintic Standard #2 Mine (primary injection well site). They both appear to be incorrect, with the latitude being off by almost a mile.

16. Your response to Item 12 of the Technical Report Outline indicates that, in supplementary injection areas, mound build-up will be limited to the base of the perched zone in the volcanic rocks. This is unacceptable. There must be no contact between the injectate and perched ground water. Mound heights must be kept well below the base of any perched zone.

17. Please provide more complete information about the perched aquifers at each proposed injection well site, i.e., depth to water, depth to base of aquifer, thickness of confining layer, etc.

18. Item 8 of Part III of the permit application guidance asks for a list of all environmental permits or construction approvals <u>received or applied for</u> relevant to this facility, while your

permit application only listed some of the permits that will be required. Please review and resubmit your response.

A Ground Water Discharge Permit may be required relative to ore storage and processing, as well as waste rock disposal.

19. Your response to Item 12 of Part III of the permit application guidance in several instances just references the technical report. Inasmuch as Part III is intended to provide a concise summary of the application, we would request that you provide these summaries.

20. It is not clear if your response to Item 15 of Part III of the permit application guidance includes water right owners. Please indicate whether or not this is the case. Also, please include the towns of Elberta and Goshen (with mailing addresses) in your Item 15 response.

21. As requested in Item 7(e) of the Technical Report Outline, please provide the fracture gradient or formation breakdown pressure of all confining beds (i.e., volcanics, etc.) in the vicinity of the proposed injection wells.

22. Wellhead installation plans for injection and extraction wells must be submitted and approved by this office prior to permit issuance. They must include provisions for making pressure tests of casing/tubing or annular spaces, as well as monitoring injectate pressure, flow rate and cumulative volume. See Item 10 of the Technical Report Outline for other requirements and considerations.

23. Please indicate whether there are any mining operations in the area (other than your own) with underground workings which could be affected by the proposed injection operation. If so, please indicate to what extent they may be impacted (i.e., flooded, etc.).

24. Please provide a contingency plan and a description of facilities to cope with well failures or shut-in (Emergency Response Plan).

25. No phone number was indicated for the applicant/owner. Please provide one if available.

26. Please provide a mailing address for the facility itself, if available.

27. Some addresses (Table 1) were missing for some of the adjacent land owners (Land Ownership Map). Please provide the missing addresses. Also, please indicate if the North Lily Minerals Company (from Table 1) is the same entity as the North Lily Mining Company (from Land Ownership Map).

If any of the evaluations requested above cannot be scientifically done, please so indicate. If you have any questions, please call Jerry Jackson at (801) 538-6146.

Sincerely,

Larry J. Mize

Larry J. Mize, P.E., Manager
Ground Water Protection Section

LJM:GLJ:ja

Enclosure

cc: Dwight Hill, Utah County Health Department (without enclosure)
Douglas Minter, EPA Region VIII (without enclosure)
Utah County Commission (without enclosure)
Wayne Hedberg, Division of Oil, Gas, and Mining (without enclosure)
Michael Georgeson, Division of Drinking Water (without enclosure)
Elberta Water Company (without enclosure)
Town of Goshen (without enclosure)
Mountainlands Assn. Of Governments (without enclosure)

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